



Microbiological study of Nunu, a spontaneously fermented milk of Ghana

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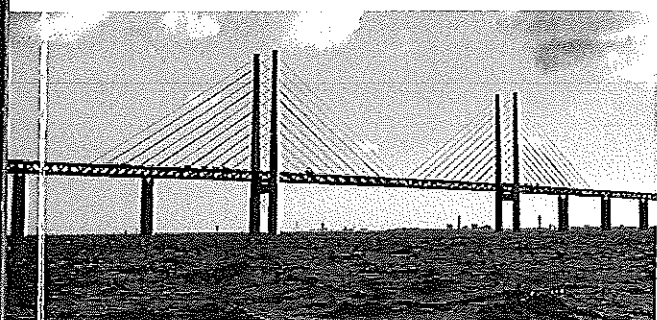
Published in:
22nd International ICFMH Symposium Food Micro 2010

Publication date:
2010

Document version
Early version, also known as pre-print

Citation for published version (APA):
Akabanda, F., Tano-Debrah, K., Glover, R., Owusu-Kwarteng, J., Nielsen, D. S., & Jespersen, L. (2010). Microbiological study of *Nunu*, a spontaneously fermented milk of Ghana. In *22nd International ICFMH Symposium Food Micro 2010*

22nd International ICFMH Symposium Food Micro 2010



Copenhagen 30th August - 3rd September



Final Programme & Abstract Book



www.foodmicro.dk

Hinenoya A	PEC1.77	Ingmer H	PEB1.21		PED2.04	Kanno S
Hinrichs J	PEA1.16		PEB1.23	Javier Y	PED2.01	Kantikova M
Hiraga Chidchom	PED2.11		PEC1.62	Jensen AN	PED1.33	Kapetanakou A
Hocking A	PEB2.56		PEC1.68	Jensen Annette N	PED1.23	
Højberg Ole	PEB1.30		PEB2.21	Jensen BB	PEE2.22	Kapetanakou, Ana
Holck A.	PEB2.52		PED2.16	Jensen LB	PEB2.45	Karamad Dina
Holvoet, K	PSD1.01	Iñiguez C	PED1.05	Jensen, Annette Nygaard	PSE1.02	Karbancıglu-Gule
Holzappel W	PEE2.21		PED2.09	Jeong A-R	PED1.34	Karbancıglu-Gül
Holzappel Wilhelm	PEE2.20	Inoue H	PEC1.77	Jeršek B	PED2.52	Karbassi A
Hondrodinou O	PED2.28	Irkin Reyhan	PED2.60	*Jespersen L	PEA1.36	Karlsen H
Hoorfar J	PEC1.07	Irkin Reyhan	PEE2.01		*PEA1.37	
	PEC1.08	Iringer F	PEA2.04		PEA1.40	Karpiskova R
	PEC1.11	Irmler Stefan	PEA1.19		PEA1.41	
	PEC1.57	Irmler, S	PSA1.03		PEB1.32	
	PEC2.01	Isaks A	PED2.13		PEE2.15	Kashi Y
	PEC2.06	Islam Mohammad	PEA1.77		PEE2.24	Kashi Yechezkel
	PED1.03	Ivanova Iskra	PEA2.17	Jespersen Lene	PEA1.10	
	PSC1.06, PSC1.04	Jacobsen T	PEC1.66	Jespersen, L	PSD1.03	
Hoorstra D	PEA1.72		PEC1.67	Ji Y	PEE2.21	Kasimoglu Dogru /
Horry H	PEC2.62	Jacxsens L	PEC2.07	Ji Yosep	PEE2.20	Katz T
Hoshino K	PEE2.13		PEC2.18	Jo MJ	PED1.34	Katz T
Houard E	PED1.08		PEC2.33	Jofré Anna	PEB2.40	Keller D
Houard E	PED1.22		PEC2.34	Johannessen Gro Skøien	PEC1.56	Kentish S
Houf, K	PSC1.05		PED1.24	Johannessen GS	PEC1.86	Khamisse Elissa
Houndenoukon M	PEA1.42	Jacxsens Liesbeth	PEC2.35	Johansson T	PEB1.26	Khan Nazer AH
Houngouigan J	PEA1.38		PEC2.36	Jongorius-Gortemaker BGM	PEB1.06	Khen B
	PEA1.42	Jacxsens, L	PSD1.01	Jonkman J	PEA1.55	
Hounhouigan JD	PEA1.14	Jafari Fereshteh	PEB1.27	Jonkuvienne Dovile	PEB2.57	Killer J
	PEA1.55	Jaime I	PEC1.54	Jooste P	PEB2.16	Kim D-H
Hovda Maria Befring	PEC1.63		PEC2.20	Jordan K	PEC2.06	KIM H-n
Hradecka Helena	PEE2.12		PEC2.21	Joris Maria-Adelheid	PED1.29	Kim H-n
Hrušková V	PEB1.20		PEC2.26		PED1.37	Kim H-Y
Huang Yanyan	PEB2.36		PED2.22	Josefsen M	PEC2.01	Kim Hyun Jung
Huang, Q	PSA2.06		PED2.32	Josefsen Mathilde	PEC1.11	Kim Y
Huber Ingrid	PEE2.11		PED2.43		PSC1.06,	Kim YG
Hudecova A	PEC1.04		PED2.44	Juliana Cunha, A	PSA1.04	Kim Y-G
	PEC1.15	Jain R	PEB1.17	Jung BY	PEB2.10	Kim Yungyeong
Hudson, A	PSD2.06	Jakobsen AN	PED1.31	Juodeikiene G	PEA1.61	Kinèrè A
Huehn S	PEC1.08	Jakobsen Anita N	PEA1.57	Kabađinsienė A	PEC2.52	Kirezieva K
Hughes S	PEE2.26	Jakobsen M	PEA1.14	Kabanova Natalja	PEC1.24	Kirilov N
Huitman J	PEA2.28		PEA1.42	Kabisch Jan	PEA2.12	Kita T
Humbot C	PEA1.44		PEA1.70	Kaesbohrer A	PED2.05	Kjeldgaard Jette
Huynh S	PEB2.46		PEB2.45	Kagkli D	PEA2.19	Klanènik A
Hwang I	PEC1.38		PED2.50	Kahraman O	PEA1.47	Klinder A
Hwang IG	PEC1.42		PEE2.14	Kakouri A	PEA1.52	
Hyeon J	PEC1.38		PSA1.01	Kalamaki M	PEA1.60	Klinder Annett
Hyeon Ji-Yeon	PEC1.39	Jaloustre Séverine	PEC1.50	Kallipolittis BH	PEB2.33	Klinder, A
Hyun JY	PEC1.42	Jan G	PEE1.01	Kalmykova Galina	PEA2.33	Knauder E
Häggbloom P	PEC1.07	Jans C	PEA1.23	Kamata Y	PEB1.02	Kneifel W
Højberg O	PEE2.22	Janssens K	PEC1.47	Kamata Yoichi	PEB1.13	Kneifel W
Ignatova T	PEA2.17	Jaros D	PEA2.32	Kampmann Y	PEC1.26	Knockaert D
Iliev I	PEA2.17	Jasick A	PEC1.40	Kaneti G	PEA1.67	Knudsen, GM
Iliev M	PEC1.91		PEC1.41	Kang Min-Su	PEB2.10	Knøchel S
Iliopoulos V	PEA2.19	Jasson V	PEC2.15	Kankare M	PEB1.26	
in 't Veld Paul	PEB1.26	Javanmard Majid	PEA2.01	Kan-King-Yu, D	PSC1.01	Kocevski D

- PEA1.37 **Microbiological study of Nunu, a spontaneously fermented milk of Ghana**
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The nature of traditional African spontaneously fermented products varies from one region to another depending on the local indigenous microflora, which reflects the climatic conditions of the area, the raw materials used, the processing conditions etc. *Nunu* is a spontaneously fermented sour milk product used as a staple food amongst certain tribes of the West African Sub-Region. The production of *nunu* is more of an art than based on scientific description and so little or no scientific information exists on it. The main purpose of this study was to isolate, identify and characterize the microorganisms present in *nunu*. In this study a survey on the production of *nunu* in northern Ghana was carried out. The survey revealed that processing of *nunu* in northern Ghana takes place at ambient conditions in local containers called calabashes or plastic containers. No starter culture is added but the milk gets contaminated with microorganisms from the environment, processing equipments, or processors. Samples of *nunu* were collected from producers in three towns. The fermentation was followed from 0 to 24 hours with two hours interval. pH was followed during processing and *nunu* was at the end of the fermentation found to have a pH of 3.4. Microbial counts were determined on selective media and counts range from 4.00 to 9.00 log CFU/ml. A total of 198 microorganisms associated with the production were isolated. The microbial diversity was evaluated using Rep-PCR and agarose gel electrophoresis. This was followed by sequencing of the 16S rRNA gene. The predominant lactic acid bacteria in *nunu* include: *Lactobacillus fermentum*, *Lactobacillus plantarum*, *Lactobacillus helveticus*, *Lactobacillus delbrueckii*, *Leuconostoc mesenteroides*, *Lactococcus garvieae*, *Enterococcus faecium*, *Enterococcus italicus*, *Weissella cibaria* and *Weissella confusa*. The results of the study do reveal that a great biodiversity of microorganisms are involved in *nunu* production and emphasize the need for selection and use of starter cultures in order to obtain controlled fermentations.

- PEA1.38 **Fermentation of Cassava fish (*Pseudotolithus* sp.) for new type of lanhoun production by starter cultures of bacillus**
Victor Bienvenu Anihouvi (1), E Sakyi-Dawson (2), GS Ayernor (3), J Hounhouigan (4)
 (1) University of Abomey-Calavi, Benin
 (2) University of Ghana, Legon Accra, Ghana
 (3) University of Ghana, Legon Accra, Ghana
 (4) University of Abomey-Calavi, Benin

Two predominant strains of *Bacillus* species previously isolated during the spontaneous fermentation of *lanhouin* were tested singly and in combination for their ability to ferment sterile flesh of cassava fish. The total viable cells pattern was enumerated according to Stevenson *et al.* (1992). The chemical changes occurring during the fermentation and the role of individual micro-organism were investigated according to Pearson's and AOAC methods. Gas Chromatography/Mass Spectrometry (GC-MS) system was used to detect aroma compounds in extracts of the inoculated fermenting samples. For all fermentations, a gradual increase in total viable cells was observed with final counts of 4.8×10^6 , 1.6×10^6 and 3.7×10^6 cfu/g after 48 h of fermentation for *Bacillus subtilis*, *Bacillus licheniformis* and a mixed culture of *B. subtilis* and *B. licheniformis* respectively. The pH values as well as the proteolytic activities in the fermenting samples increased as the fermentation progressed. The histamine contents in all inoculated samples were very low and less than 1mg/100g sample. A total of 41 aroma compounds were detected in the inoculated samples with carbonyls and lipid-derived compounds as the predominant ones. These compounds consisted of 5 aliphatic hydrocarbons, 4 aromatic hydrocarbons, 5 esters, 6 ketones, 4 acids, 4 alcohols, 8 amines, 3 aldehydes and 1 amide. In contrast to the spontaneous fermentation, aroma compounds such as furan, phenol, thiazoles and pyrroles were not detected during the inoculated fermentation samples.

- PEA1.39 **Bacterial community in Amerindian fermented pumpkin, banana, cotton seed associated with seed cotton**
Cintia Ramos (1), UFLA, Brazil
 (1) UFLA, Brazil
 (2) UNILAVRAS,

Cauim is a fermented beverage made from pumpkin, banana, cotton seed associated with seed cotton. Samples of cotton seed cauim of fermentation. The bacterial community of 33 morphotypes were (12.96%), Gram-positive category species *Lactobacillus* sp (13 (10.63%)), and *Lactobacillus* largest number of isolates at the presence of lactic acid. DGGE analysis were performed to determine the dominance of *Lactobacillus* not modified significantly. T dependent method.

- PEA1.40 **Genotypic and phenotypic characterization of *Lactobacillus* strains isolated from fermented indigenous African foods**
David B Adimp
 (1) University of Ghana, Legon
 (2) Chr. Hansen

Fermented indigenous African foods are an important part of the food culture in many African countries. The fermentation process is a traditional method of food preservation and to a lesser extent *Pedio* indigenous African foods by fermentation of appropriate multifunctional fermenting cocoa beans, do then followed by sequencing to identify strains belonging to the identity of the 16S rRNA sequence. The isolates were identified with species included growth speed, multiplication patterns, minimum inhibition concentration using the API ZYM kit (bioMérieux). The isolates were able to inhibit the growth of *Staphylococcus aureus* on agar with bile salt concentrations ranging from 0.5 to 10% β -glucuronidase, α -mannanase and with the intention to feed industry.